AMENDMENTS TO THE CLAIMS

1. (currently amended): A capillary electrophoresis chip apparatus for detecting a nucleotide polymorphism or a single nucleotide polymorphism, said apparatus comprising an electrophoresis chip comprising:

an upper channel layer, comprising a ~~two-dimensional or multidimensional microfluid~~ first-dimension microfluidic channel, a plurality of second-dimension microfluidic channels in fluid communication with the first-dimension microfluidic channel, and **[[**an**]]** two or more sets of electrode ~~aperture~~ apertures in fluid communication with the first-dimension microfluidic channel and with the plurality of second-dimension microfluidic channels ~~for loading a sample~~;

a middle electrode layer capable of sealing the ~~microfluid~~ first-dimension microfluidic channel and the plurality of second-dimension microfluidic channels to form **[[**an**]]** intact ~~capillary~~ capillaries, said middle electrode layer comprising electrodes capable of providing a needed voltage ~~for the electrophoresis chip~~ along the first-dimension microfluidic channel and along the plurality of second-dimension microfluidic channels; and

a lower heating layer capable of providing a stable temperature gradient for electrophoresis along the plurality of second-dimension microfluidic channels, said lower heating layer comprising two or more sets of temperature control elements that are spaced apart from each other and positioned approximately perpendicular to the plurality of second-dimension microfluidic channels,

wherein the upper channel layer, the middle electrode layer, and the lower heating layer are ~~thermal~~ thermally conductive and adhesive to each other, and the capillary electrophoresis chip apparatus is capable of detecting a nucleotide polymorphism or a single nucleotide polymorphism.

2. (canceled)

3. (currently amended): The capillary electrophoresis chip apparatus of claim 1, wherein the sectional width or diameter of the ~~microfluid~~ first-dimension microfluidic channel and the plurality of second-dimension microfluidic channels is between 5 to 200 μm; the depth of the ~~microfluid~~ first-dimension microfluidic channel and the plurality of second-dimension microfluidic

channels is between 5 to 200 μm; and the total length of the ~~microfluid~~ first-dimension microfluidic channel and the plurality of second-dimension microfluidic channels is between 1 to 30 cm.

4. (previously presented): The capillary electrophoresis chip apparatus of claim 1, wherein the middle electrode layer is made of gold, platinum, or graphite.

5. (previously presented): The capillary electrophoresis chip apparatus of claim 1, wherein the middle electrode layer is coated with a layer of polydimethylsiloxane (PDMS).

6. (previously presented): The capillary electrophoresis chip apparatus of claim 1, wherein each temperature control element is kept at a different constant temperature so as to form a spatial temperature gradient.

7. (previously presented): The capillary electrophoresis chip apparatus of claim 1, wherein the stable temperature gradient is a temporal temperature gradient established by gradually and uniformly heating the whole chip.

8. (currently amended): The capillary electrophoresis chip apparatus of claim 1, wherein the upper channel layer comprises a ~~two-dimensional microfluid~~ first-dimension microfluidic channel and a plurality of second-dimension microfluidic channels in fluid communication with the first-dimension microfluidic channel, and the lower heating layer comprises two sets of temperature control elements that are spaced apart from each other and positioned underneath the plurality of second-dimension microfluidic channels, wherein each temperature control element is kept at a different constant temperature so as to form a spatial temperature gradient.

9. (new): The capillary electrophoresis chip apparatus of claim 1, wherein the sectional width or diameter of the first-dimension microfluidic channel and the plurality of second-dimension microfluidic channels ranges from 5 to 200 μm.

10. (new): The capillary electrophoresis chip apparatus of claim 1, wherein the first-dimension microfluidic channel has a sectional width or diameter of 100 μm.

11. (new): The capillary electrophoresis chip apparatus of claim 1, wherein each of the plurality of second-dimension microfluidic channels has a sectional width or diameter of 100 μm.

12. (new): The capillary electrophoresis chip apparatus of claim 1, wherein the depth of the first-dimension microfluidic channel and the plurality of second-dimension microfluidic channels ranges from 5 to 200 μm.

13. (new): The capillary electrophoresis chip apparatus of claim 1, wherein the first-dimension microfluidic channel has a depth of 10 μm.

14. (new): The capillary electrophoresis chip apparatus of claim 1, wherein each of the plurality of second-dimension microfluidic channels has a depth of 10 μm.

15. (new): The capillary electrophoresis chip apparatus of claim 1, wherein the total length of the first-dimension microfluidic channel and the plurality of second-dimension microfluidic channels ranges from 1 to 30 cm.

16. (new): The capillary electrophoresis chip apparatus of claim 1, wherein the total length of the first-dimension microfluidic channel and the plurality of second-dimension microfluidic channels is 30 cm.

17. (new): The capillary electrophoresis chip apparatus of claim 1, wherein the upper channel layer comprises 50 second-dimension microfluidic channels.

18. (new): The capillary electrophoresis chip apparatus of claim 1, wherein the plurality of second-dimension microfluidic channels are spaced 100 μm from each other.

19. (new): The capillary electrophoresis chip apparatus of claim 1, wherein the upper channel layer further comprises a plurality of connecting channels in fluid communication with the plurality of second-dimension microfluidic channels and with the electrode apertures.

20. (new): The capillary electrophoresis chip apparatus of claim 19, wherein each of the plurality of connecting channels has a width of 20 μm.